

Evaluation of ^{59}Co Reaction Cross Sections

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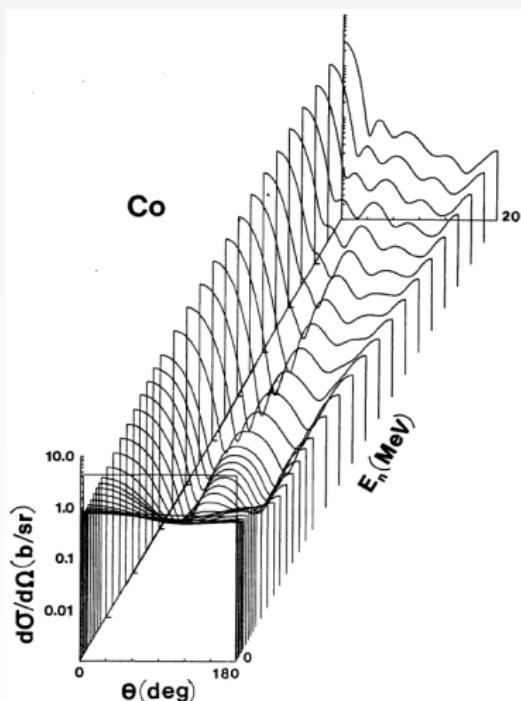
Nuclear Data Week, BNL, 11/14–18, 2016

Introduction

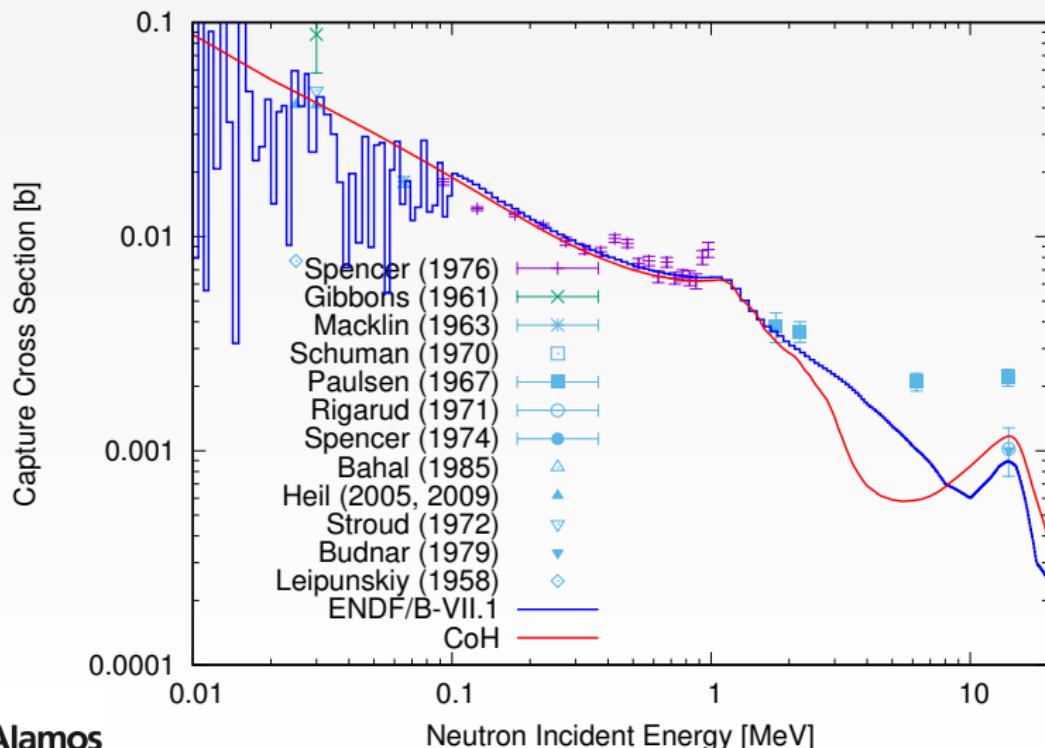
- Status of ^{59}Co Evaluation

- Resonance parameters by de Saussure et al. (Ann. Nucl. Energy **19**, 292 (1992))
- Above resonance region, evaluated by A. Smith et al. in 1988 (ANL/NDM-107)
 - MF=4 and 5 are used for $(n,2n)$, (n,np) , etc.
 - isotropic angular distributions given
 - no proton and α -particle angular distribution
 - energy spectra calculated with ALICE and CADE codes
 - γ -ray production data very limited

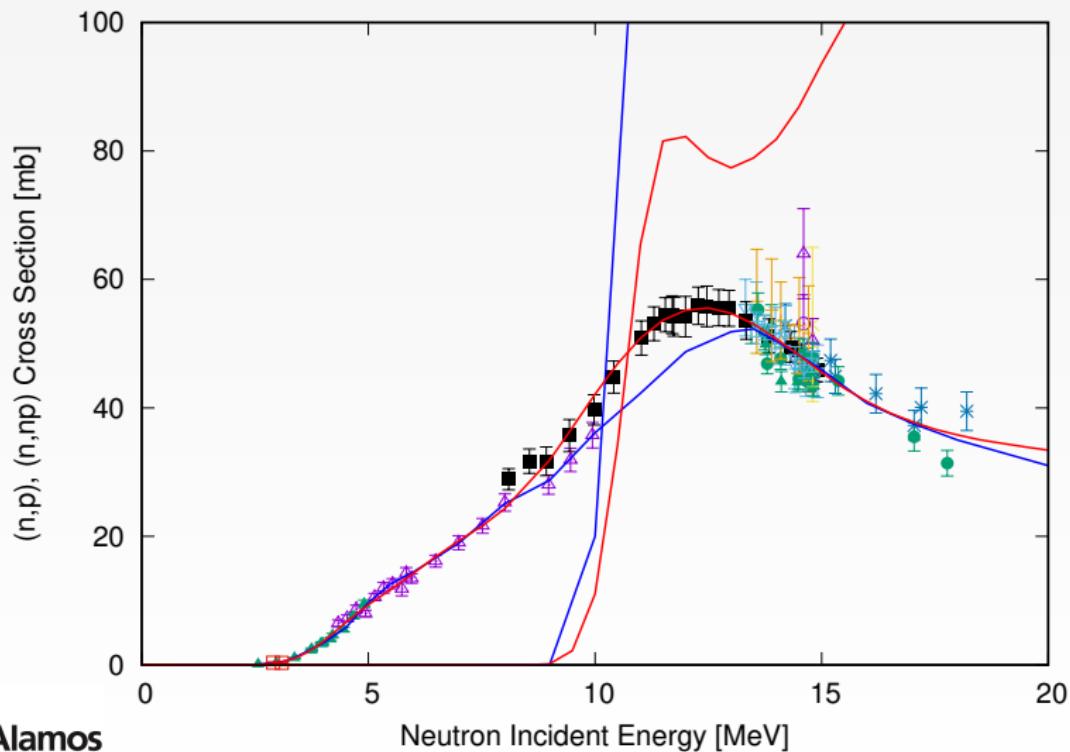
- Re-evaluation of cross sections above resonance range (100 keV) with CoH_3



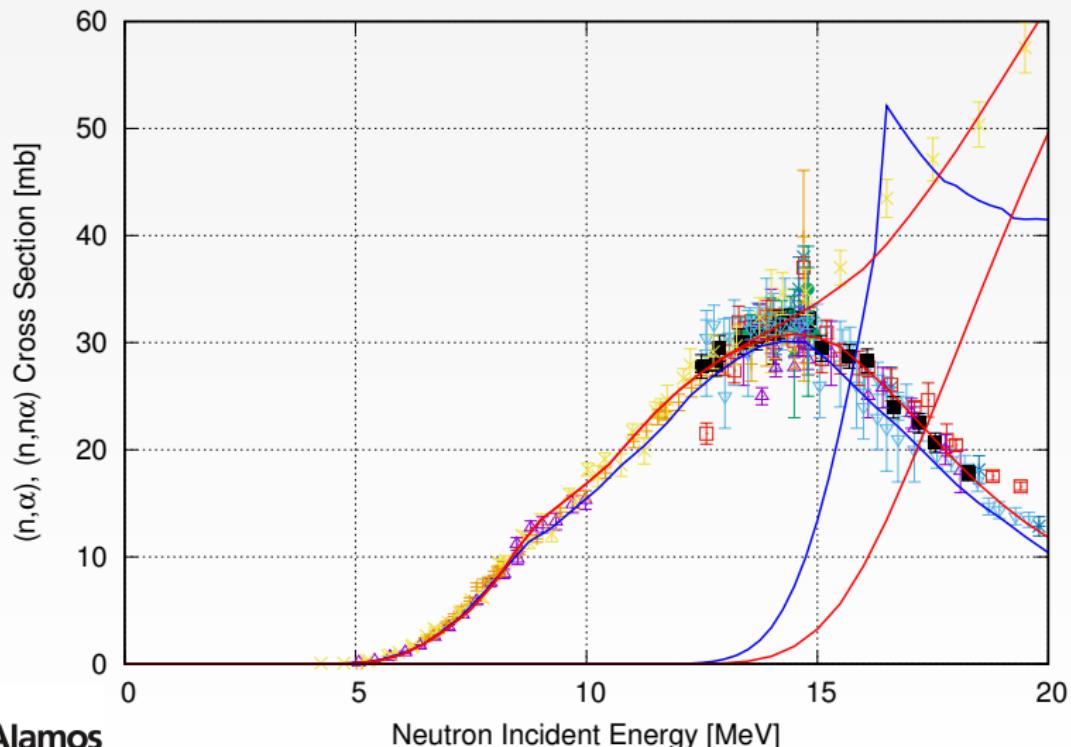
Capture Cross Section: ENDF/B-VII.1 and present



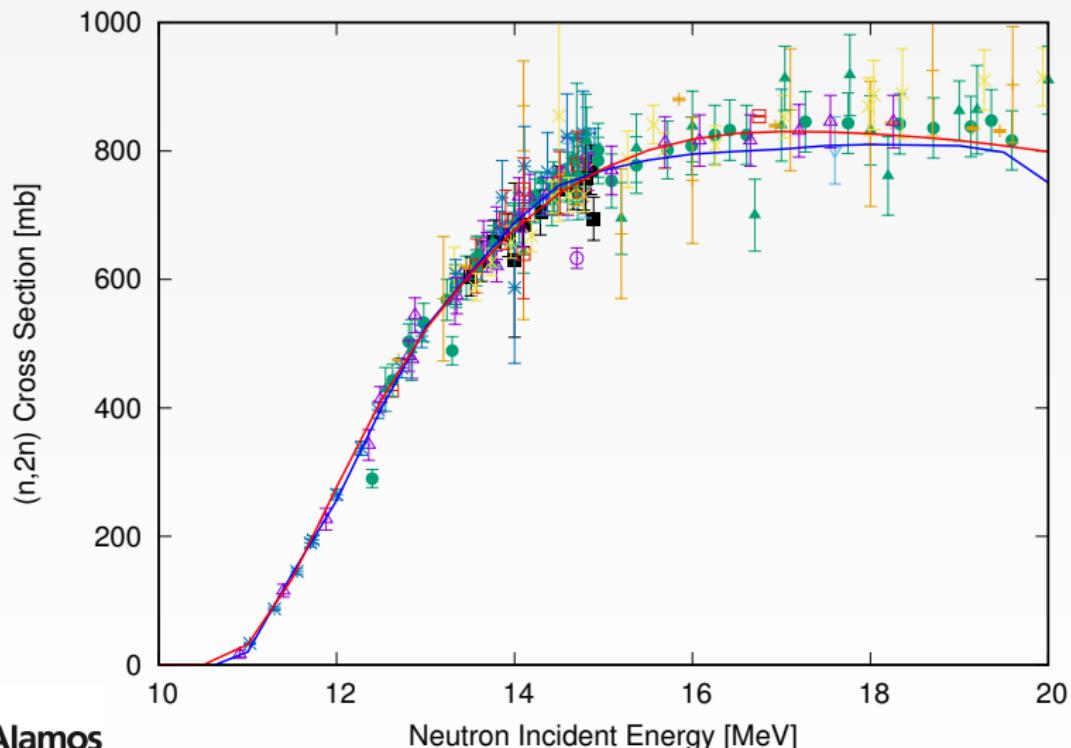
(n,p) and (n,np) Comparison, ENDF/B-VII.1 and present



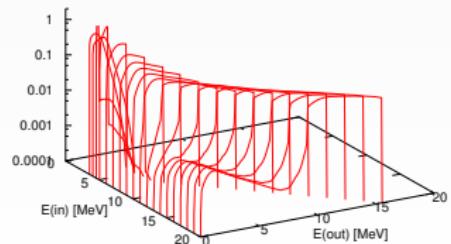
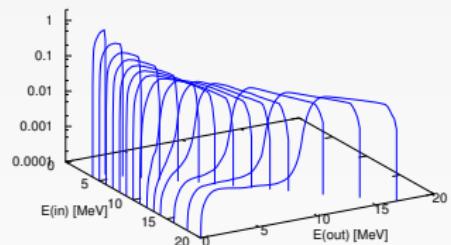
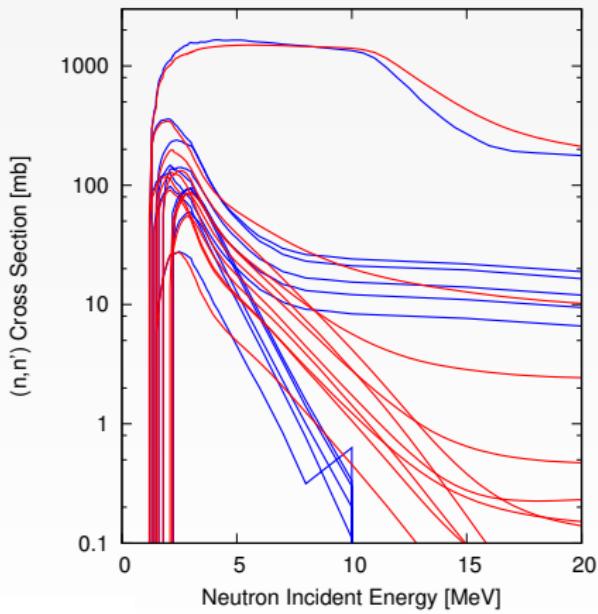
(n, α) and (n,n α) Comparison, ENDF/B-VII.1 and present



(n,2n) Comparison, ENDF/B-VII.1 and present



(n,n') Comparison, ENDF/B-VII.1 and present



Summary

- Coupled-channels calculation for $(7/2)^{-}$ - $(9/2)^{-}$, and DWBA for 8 levels
- Updated cross sections
 - (n,n') , $(n,2n)$, $(n,3n)$, (n,p) , (n,np) , (n,α) , $(n,n\alpha)$, (n,d) , (n,nd) , (n,t) , $(n,{}^3He)$, $(n,2p)$,
 $(n,p\alpha)$, $(n,2np)$ and (n,γ)
- Angular distributions for elastic in MF4
- Angular distributions for inelastic in MF6, with photon production in MF12/14
- Energy and angular distributions
 - (n,n') , $(n,2n)$, $(n,3n)$, (n,p) , (n,np) , (n,α) , $(n,n\alpha)$, (n,d) , (n,nd) , (n,t) , $(n,{}^3He)$, $(n,2p)$,
 $(n,p\alpha)$, and $(n,2np)$
 - with associated photon productions in MF6
- Capture γ -ray production in MF6